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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/694,848 | 10/29/2003 | Kenji Otsuka | 396.43215X00 | 6272 |

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| EXAMINER | |
|---|---|
| STRICKLAND, JONAS N | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1754 | |

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/694,848 | OTSUKA ET AL. | |
| | Examiner | Art Unit | |
| | Jonas N. Strickland | 1754 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 5-7, 10, 11, 14, 16, 28-30, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Erb et al. (US Patent 3,361,531).

Erb et al. discloses the removal of oxygen from gas mixtures using a purification agent comprised of manganese oxide and an iron oxide, which exhibits high oxygen absorptive capacity (col. 3, lines 18-24). The purification agent is comprised of 90% of manganese oxide, such as MnO (col. 6, lines 40-58). Furthermore, Erb et al. discloses wherein nitrogen and argon may be purified by using the purification agent (col. 6, lines 45-50 and col. 8, lines 42-75). Erb et al. continues to disclose wherein the manganese/iron oxide adsorbents are contacted and reactivated with a hydrogen gas mixture in-situ (col. 12, lines 68-73). Erb et al. discloses a reactivation temperature at 325°C (see Table F, col. 11).

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 2, 4, 12, 13, 15, 17- 21, 23-27, and 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erb et al. (US Patent 3,361,531) in view of Moreau et al. (US Patent 6,221,492 B1).

Applicant claims with respect to claims 2, 4, 12, 13, 15, 17- 21, 23-27, and 33-39, a process for purifying an inert gas for removing impurities such as oxygen, carbon dioxide and moisture contained in the inert gas with a purification agent comprised of a zeolite, a manganese oxide, and at least one kind of metal oxide, such as an iron oxide.

The teachings of Erb et al. have been discussed with respect to claims 1, 3, 5-7, 10, 11, 14, 16, 28-30, and 32. However, Erb et al. does not disclose wherein the purification agent is comprised of a zeolite.

Moreau et al. teaches an adsorbent particle, which adsorbs oxygen from a gas flow comprised of nitrogen (col. 4, lines 63-67). The adsorbent is comprised of zeolite and metal cations, such as manganese and iron (col. 3, lines 43-52). The feed gas flow, wherein the gas is to be treated is at a temperature between 10°C and 100°C (col. 4, lines 51-55).

Therefore, it would have been obvious to of ordinary skill in the art to modify the teachings of Erb et al. based on the teachings of Moreau et al. by adsorbing an impurity from an inert gas stream, such as oxygen from a nitrogen stream by using an adsorbent comprised of a manganese oxide, iron oxide, and a zeolite, since Moreau et al. teaches an adsorbent particle, which adsorbs oxygen from a gas flow comprised of nitrogen, wherein the adsorbent is comprised of a manganese oxide, iron oxide, and a zeolite. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art, would have expected a process for adsorbing an impurity from an inert gas, such as taught by Moreau et al. to have been similarly useful and applicable to a process for adsorbing an impurity from an inert gas as taught by Erb et al.

With respect to claims 4 and 15, Erb et al. discloses wherein a hydrogen reproduction gas contacts the purification agent at a temperature of 325°C.

With respect to claims 18-20, Erb et al., discloses wherein the purification agent is comprised of 90% of manganese oxide, such as MnO (col. 6, lines 40-58).

With respect to claims 21 and 37, it is held that they are product-by process claims, wherein the reference teaches a product that appears to be the same as, or an obvious variant of, the product set forth in a product-by-process claim although produced by a different process. See In re Marosi, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) and In re Thorpe, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). See also MPEP 2113.

7. Claims 8 and 31 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Erb et al. (US Patent 3,361,531).

Erb et al. discloses the removal of oxygen from gas mixtures using a purification agent comprised of manganese oxide and an iron oxide, which exhibits high oxygen absorptive capacity (col. 3, lines 18-24). The purification agent is comprised of 90% of manganese oxide, such as MnO (col. 6, lines 40-58).

The Examiner holds claims 8 and 31 to be product- by-process claims, wherein the reference teaches a product that appears to be the same as, or an obvious variant of, the product set forth in a product-by-process claim although produced by a different process. See In re Marosi, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) and In re Thorpe, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). See also MPEP 2113. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-

process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process."

8. Claims 9 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erb et al. (US Patent 3,361,531) in view of Moreau et al. (US Patent 6,221,492 B1) as applied to claims 2, 4, 12, 13, 15, 17- 21, 23-27, and 33-39 above, and further in view of Prigge et al. (US Patent 5,051,117).

Applicant claims with respect to claims 9 and 22, wherein the process for purifying the inert gas uses a synthetic zeolite having a pore diameter in the range of 3 to 10 A.

The teachings of Erb et al. and Moreau et al. have been discussed with respect to claims 2, 4, 12, 13, 15, 17- 21, 23-27, and 33-39. However, the references do not teach the pore diameter of the zeolite.

Prigge et al. teaches a process for removing gaseous contaminants from carrier gases using a zeolite. The carrier gas may be a noble gas, such as argon (col. 1, lines 44-50; col. 3, lines 26-30). The suitable zeolites have a pore size between 4 and 20 A (col. 3, lines 43-44).

Therefore, it would have been obvious to one of ordinary skill in the art, to modify the teachings of Erb et al. and Moreau et al. by using a zeolite to remove impurities from an inert gas, wherein the zeolite has a pore volume of diameter in the range of 3 to 10 A, based on the teachings of Prigge et al., which teaches using a zeolite to adsorb impurities from an inert gas by using a zeolite having a pore volume of between 4 and 20 A. Such modification would have been obvious to one of ordinary skill in the art,

because one of ordinary skill in the art, would have expected a process for treating a carrier gas, which may include inert gases as taught by Prigge et al., to have been similarly useful and applicable to a process for treating inert gases using a zeolite as disclosed by Erb et al. as modified by Moreau et al.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. JP-2000159518 A; EP 681867 A1; JP 61212327 A; USP 5,891,220; USP 5,194,233; USP 4,869,883; USP 5,968,468.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonas N. Strickland whose telephone number is 571-272-1359. The examiner can normally be reached on M-TH, 7:30-5:00, off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jonas N. Strickland
March 30, 2005

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